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HEWLETT-PACKARD COMPANY
Intellectual Property Administration
P.O. Box 272400
Fort Collins, CO 80527-2400

EXAMINER

NGUYEN, MINH T

ART UNIT

PAPER NUMBER

2816

DATE MAILED: 05/08/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/921,471

Applicant(s)

MARSHALL ET AL.

Examiner

Minh Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☒ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Oath/Declaration

1. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because: "UA" in the citizenship section of the first inventor appears to be misspelled.

Specification

2 The disclosure is objected to because of the following informalities:

"REFERENCEVOLTAGE" in the title should be changed to -- REFERENCE VOLTAGE --.

Appropriate correction is required.

Claim Objections

3. Claims 14-17 are objected to because of the following informalities:

As per claim 14, the term "an electrical high level" recited on line 3 should be changed to -- an electrical high level of the input voltage--.

As per claim 15, the term "an electrical low level" recited on line 3 should be changed to -- an electrical low level of the input voltage--.

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As per claim 16, the term "said reference voltage" recited on line 2 should be changed to -- a reference voltage -- to avoid antecedent basis. The term "an electrical high level" recited on line 3 should be changed to -- an electrical high level of the input voltage--.

As per claim 17, the term "said reference voltage" recited on line 2 should be changed to -- a reference voltage -- to avoid antecedent basis. The term "an electrical low level" recited on line 3 should be changed to -- an electrical low level of the input voltage--.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 16-18 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a specific circuit for tracking an input voltage as shown in Fig. 3 of the drawings, does not reasonably provide enablement for every conceivable means for achieving the stated purpose. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to practice the invention commensurate in scope with these claims. The claim covers every conceivable structure (means) for achieving the stated result while the specification discloses at most only those known to the inventor, i.e., the one shown in Fig. 3. Please see MPEP 2164.08(a) for further explanation.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-3 and 14-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As per claim 1, the claim is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: the claim does not have all the essential steps necessary to obtain the claimed function/result, i.e., the function/result recited on the last four lines does not result simply from a single recited step of moving a reference voltage from a first voltage level to a second voltage level. The steps of comparing, performing the moving using a counter and a multiplexer, converting to a digital stage, ... are needed.

As per claim 2, this claim is also rejected for the same reason noted in claim 1 since the claim recites no step for performing the recited function.

As per claim 3, this claim is also rejected for the same reason noted in claim 1 since the claim recites no step for comparing in order to know whether the first voltage level is closer to the received voltage level than the second voltage level.

As per claim 14, the claim is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: the claim does not have all the essential steps necessary to obtain the claimed function/result, i.e., the function/result recited on the last seven lines does not result simply from a single step of tracking an input voltage with a reference voltage as recited in the claim.

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As per claim 15, this claim is rejected for the same reasons noted in claim 14.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 4-6, 8, 10 and 12-21 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent No. 5,233,329, issued to Lippmann et al.

As per claim 16, Lippmann discloses an apparatus (Fig. 1), comprising:

means (Fig. 1) for tracking an input voltage (on line 39) with a reference voltage (on line 31) so that the voltage difference between an electrical high level of the input voltage and the reference voltage is increased by the change in said input signal as said input signal transitions from an electrical low level to the electrical high level and the voltage difference between the electrical high level and the reference voltage is decreased by increasing the reference voltage after the input signal transitions (comparator 30 does the comparison and outputs the result signal to the counter 32 to count UP or DOWN, and the counter issues a control signal to select the reference voltage which satisfies the recited function).

As per claim 17, Lippmann discloses an apparatus (Fig. 1), comprising:

means (Fig. 1) for tracking an input voltage (on line 39) with a reference voltage (on line 31) so that the voltage difference between an electrical low level and the reference voltage is increased by the change in said input signal as said input signal transitions from an electrical

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high level to the electrical low level and the voltage difference between the electrical low level and the reference voltage is decreased by decreasing the reference voltage after the input signal transitions (comparator 30 does the comparison and outputs the signal to the counter 32 to count UP or DOWN, and the counter issues a control signal to select the reference voltage which satisfies the recited function).

As per claim 18, Lippmann discloses a circuit (Fig. 1) comprising:

means (the circuit shown in Fig. 1) for moving a reference voltage (on line 31) from a first voltage level (B) to a second voltage level (A) wherein the second voltage level A is closer to a received voltage level (on line 39) than the first voltage level and wherein the reference voltage 39 is compared (by the comparator 30) to the received voltage level to determine a digital state of the received voltage level (using the counter 32).

As per claim 19, Lippmann discloses a circuit (Fig. 1) comprising:

a differential receiver 30 that compares an input signal 39 (generated by a sensor 38) and a reference signal 31 (the signal from the output of MUX 28); and

a reference signal control (the circuits 32, 34, 28 and 16) responsive to said differential receiver that adjusts the reference signal over a period of time to approach the input signal (the signal from the output of the differential receiver 30 controls the UP/DOWN counter to select the appropriate reference voltage for use as a reference signal 31).

As per claim 20, Lippmann further discloses the reference signal control comprises:

a saturating counter 32 wherein the count direction of the counter is responsive to the differential receiver (because the output signal from the differential receiver controls the UP/DOWN counter selection); and

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an analog MUX 28 responsive to said saturating counter (the signal on line 36 selects the either the reference signal) that selects one of a plurality of input voltages (A and B).

As per claim 21, the recited resistive ladder reads on the resistor ladder 16.

As per claim 1, Lippmann discloses a method (Fig. 1), comprising:

moving a reference voltage from a first voltage level to a second voltage level (the MUX 28, switching the output signal on line 31 from the voltage level A to voltage level B), the functional recited on the last four lines are performed by the input signal 39, the comparator 30, the counter 32 and the ladder network 16).

As per claim 4, Lippmann discloses a method (Fig. 1), comprising:

comparing a parameter (the voltage level) of an input signal (on line 39) to a parameter (the voltage level) of a reference (on line 31) to determine a logical state of the input signal (the result is at the output of the comparator 30); and

adjusting the parameter of the reference (MUX 28 and counter 32) to reduce the difference.

As per claim 5, the recited limitation is met because the output of the comparator is either LOW or HIGH.

As per claim 6, Lippmann discloses a method (Fig. 1), comprising:

comparing (the comparator 30) a parameter of an input signal (the level voltage of the input signal on line 39) to a parameter of a reference (the reference voltage level on line 31) to determine a logical state of the input signal, the limitation that the parameter of the input signal has a nominal value representing a logical low and a nominal value representing a logical high is

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merely a definition and is met when defining a certain voltage level on line 39 representing a logical high and another certain voltage level on line 39 representing a logical low;

adjusting (the MUX 28) the parameter of the reference (change the voltage level of the reference on line 31) to reduce a difference, the limitation on the last three lines is met because it is merely the result operation of the circuit.

As per claim 8, Lippmann discloses a method (Fig. 1) for receiving a digital signal (on line 39), comprising:

comparing (comparator 30) the digital signal to a reference voltage (on line 31);

determining when the digital signal has changed from greater than the reference voltage to less than the reference voltage (output a signal at the output of the comparator 30); and

reducing the reference voltage after the digital signal has changed from being greater than the reference voltage to being less than (using the UP/DOWN counter 32 and the MUX 28).

As per claim 10, Lippmann discloses a method (Fig. 1) for receiving a digital signal (on line 39), comprising:

comparing (comparator 30) the digital signal to a reference voltage (on line 31);

determining when the digital signal has changed from being less than the reference voltage to being greater than the reference voltage (output a signal at the output of the comparator 30); and

increasing the reference voltage after the digital signal has changed from being less than the reference voltage to being greater than (using the UP/DOWN counter 32 and the MUX 28).

As per claim 12, Lippmann discloses a method (Fig. 1), comprising:

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adjusting (MUX 28) a reference voltage (on line 31) between a first nominal reference level A and a second nominal reference level B;

adjusting (MUX 28) the reference voltage (on line 31) between the second nominal reference level B and the first nominal reference level A;

comparing (comparator 30) a signal (on line 39) to the first nominal reference level A when the signal is closer to the first nominal reference level A than the second nominal reference level B; and

comparing (comparator 30) the signal (on line 39) to the second nominal reference level B when the signal is closer to the second nominal reference level B than the first nominal reference level A;

As per claim 13, the recited limitation is met because the result of the comparison is used to adjust the reference level on line 31.

As per claims 14-15, these claims are merely methods to operate the circuits having structures recited in claims 16-17, respectively. Since Lippmann teaches the circuits, he inherently teaches the methods to operate.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2-3, 7, 9, 11 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 5,233,329, issued to Lippmann et al.

As per claim 22, Lippmann discloses a circuit which has the structure recited in the claim as discussed in details above regarding claim 20 wherein the saturating counter 32 is clocked by a clock signal CLK which is supplied on line 43.

Lippmann does not explicitly disclose that the clock signal has a period that is much less than the minimum expected time for the input signal to remain in on logical state as called for in the claim, i.e., the claim calls for a specific range of frequencies of the clock signal.

However, it has been ruled that “where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.”. See MPEP 2144.05 for further discussions.

It would have been obvious to one skilled in the art at the time of the invention was made to clock the counter by a clock signal having a period that is much less than the minimum expected time for the input signal to remain in on logical state.

The motivation/suggestion for that would be to obtain an optimum performance for Lippmann’s circuit.

As per claims 2, 7, 9 and 11, these claims are rejected for the same reason and motivation discussed in claim 22.

As per claim 3, the recited step is performed by the MUX 28, i.e., switching the output signal from B to A.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US Patent No. 5,376,834 to Carobolante discloses a circuit (Fig. 2) which includes a resistor ladder 28', an analog MUX 25, a comparator 42 for comparing an input signal ANALOG IN versus a reference signal on line 26 and a counter 30.

US Patent No. 6,225,929 to Beck discloses a circuit (Fig. 6) which includes a comparator 204, counter 206 and a resistor ladder (inside the DAC 30/130).

US Patent No. 4,527,148 to Kuboli et al. discloses a circuit (Fig. 2) which includes a comparator 3, a resistive ladder 21, a MUX 22, a counter 20.

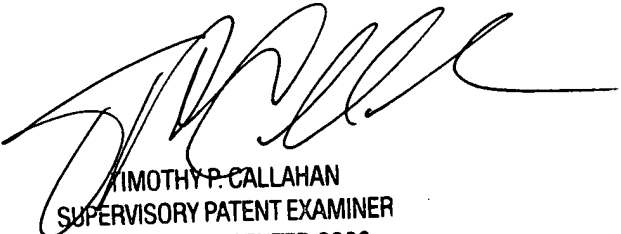
9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Minh Nguyen whose telephone number is 703-306-9179. The examiner can normally be reached on Monday - Thursday 7:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Callahan can be reached on 703-308-4876. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.



MN
May 3, 2002


TIMOTHY P. CALLAHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800